

black ; the thighs are very flat and wide, inclining to ovate ; tibiae armed with long black bristles.

This I believe is the largest flea known, but I have not been able to ascertain upon what animal it was captured.

(Concluded.)

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## ON TWO NEW CHALCID FLIES FROM FLORIDA, PARASITIC UPON THE LARVÆ OF SYRPHUS FLIES.

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Having continued my investigations on Orange Insects, I have made many other discoveries. Among these probably the most interesting is the breeding of two species of *Chalcids* from the larvæ of *Syrphus* flies.

Now, as a general rule, the *Chalcididæ* must be considered beneficial, the majority of them preying upon other insects injurious to the agriculturist, the species belonging to the *Eurytomide* genus *Isosoma*, being, I believe, the only vegetable feeders known among them.

In my recent pamphlet on "Orange Insects," I described and figured several bred from Aphides, Coccides, etc.; besides, I have since bred hundreds from other sources, and all may be considered beneficial.

Nevertheless, there are exceptions to all rules, and those now under consideration must come under that head and be classed as injurious, because they prey upon the larvæ of flies which destroy our orange aphides—pests particularly troublesome to the orange grower in spring and fall. Another strange fact about these *Chalcids*, and which needs a thorough investigation, is this: How do so many manage to live in and subsist upon the *Syrphus* without destroying it at once? For it is not until the larva has transformed into a puparium, that these little parasites themselves transform—first into pupæ, and afterwards into perfect flies, which escape by eating a hole through the head of the puparium. From a single puparium I had 18 *Chalcids* (5 males and 13 females). On carefully opening another, I found it closely packed with *Chalcid* pupæ, like "sardines in a box." Undoubtedly all of these lived as minute worms in the larva of the *Syrphus* fly, feeding day after day on the fatty substance, but

instinctively avoiding all vital organs. Alas, poor larva! For days the victim of these minute worms, and like the misery of some poor mortal, finds release from suffering only in death.

In Europe, Westwood, Introduction to the Modern Classification of Insects, vol. 2, p. 160, states that *Eupelinus syrphi* Bouche, infests the larvæ of *Syrphus ribesii* and *S. balteatus*. In vol. 1, p. 423, that *Spalangia nigra* is parasitic on the pupæ of the common house fly, *Musca domestica*.

In America I do not know of any having been described from *Syrphus* flies, excepting *Eriophilus mali* Hald. I consequently presume these are unknown to science, and submit the following descriptions:

SPALANGIA? SYRPHI, n. sp. ?

♀. Length .07 inch. Head and thorax black, coarsely, uniformly, but not deeply punctate, and with slight purplish and brassy reflections. Head transverse, much broader than thorax, mandibles 4-dentate, dentations not so deep as in ♂; antennæ 11-jointed, reddish-brown, slightly but gradually widening towards tip, covered with short pubescence; thorax—parapsidal grooves converging towards scutellum, but abruptly ending at middle of mesothorax; collare very short, hardly visible, scutellum convex; abdomen ovate, brownish black, smooth and highly polished, with a slight cupreous tinge at base, and attached to thorax by a short peduncle; legs honey yellow, anterior and middle femora dark, posterior pair being brownish black; wings hyaline, iridescent, veins greenish yellow, stigma slightly thickened at base, stigmal vein with a little pointed knob near the tip.

♂. Length .05 inch. Head and thorax bright greenish golden, punctation as in ♀; antennæ 11-jointed, filiform, reddish brown and covered with rather long hairs, collare very short, hardly visible, purplish; abdomen ovate, purplish black, smooth and shining, with a short peduncle; legs honey yellow, coxæ brassy; wings hyaline iridescent.

Described from 2 ♂ and 5 ♀ specimens bred from the pupæ of *Syrphus philadelphicus*.

PTEROMALUS 4-MACULATÆ, n. sp.

♀. Length .05 inch. Head wider than thorax, bluish purple, microscopically punctate, with mouth parts brownish black; eyes brownish, antennæ 9-jointed, reddish brown, scape very long, as long as all the others combined excepting club; 2nd joint as long as 3 and 4 combined and

thicker; 3rd shortest, others slightly widening towards tip; 9th broadly fusiform and longer than joints 6, 7 and 8 combined; thorax about twice as long as broad, microscopically punctate and with a slight brassy tinge and sparsely pubescent; collare hardly visible; praescutum much broader than long, convex, occupying nearly the whole mesothorax, scuti small, triangular and purplish; scutellum rather large, convex, triangular, tinged with brassy and with the basal margin purplish; pleuræ large, convex, smooth and shining; abdomen very short, sessile, flattened and triangular when seen from above; legs—coxæ brownish, femora and more than half of the tibiæ brownish yellow, tip of femora and balance of tibiae and feet honey yellow, hind legs with rather long tibial spur; wings hyaline, iridescent, with only a short costa and stigmal vein, reaching to one-third the length of wing.

♂. Length .04 inch. Head purplish, vertex and face brassy, microscopically punctate, with a few larger punctures scattered in front of ocelli; antennae 8-jointed, filiform, scape shorter than in ♀ and with the joints irregular and covered with long hairs; callare, unlike the female, is transverse quadrate; scutellum triangular with a brassy tinge and the edges rounded; abdomen longer than in female, blackish.

Varieties of the male occur with the head, thorax and scutellum as in the female, with an attenuated, transverse collare and with 9-jointed antennae; also with coarse punctures on the face and along the margin of the eyes, and with the middle pair of femora yellowish.

These varieties are important as showing how certain species of Chalcid flies are liable to vary in coloration and structure, even those bred from the same brood.

Described from 18 females and 8 males; 13 females and 5 males raised from one larva, and 3 males and 5 females raised from another larva of *Syrphus 4-maculatus* Ashmead, in November, 1880.

This species I place in the genus *Pteromalus* provisionally, for the reason that the description was made from dry specimens and the antennae in the ♂ and the structure of the abdomen of both sexes was too much shrunken to make a critical examination.